



SIMATIC S7-300, CPU 315T-3 PN/DP,
CENTRAL PROCESSING UNIT FOR PLC AND
TECHNOLOGY,
384 KBYTE WORKING MEMORY,
1. INTERFACE MPI/DP 12MBIT/S,
2. INTERFACE DP(DRIVE),
3. INTERFACE ETHERNET PROFINET WITH 2 PORT
SWITCH,
INTEGRATED I/O FOR TECHNOLOGY,
FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY
CARD MIN. 8 MB NECESSARY

General information

Hardware product version	01
Firmware version	CPU: V3.2; integrated technology V4.1.5

Supply voltage

24 V DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
External protection for supply cables (recommendation)	2 A min.

Load voltage L+

Rated value (DC)	24 V
Reverse polarity protection	Yes

Digital outputs

Load voltage L+

Rated value (DC)	24 V ; (2L+)
Reverse polarity protection	No ; (2L+)

Input current

Current consumption (rated value)	1050 mA
Current consumption (in no-load operation), typ.	230 mA
Inrush current, typ.	6.5 A

I²	1 A ² ·s
Power losses	
Power loss, typ.	7.5 W
Memory	
Type of memory	other
Work memory	
integrated	384 kbyte
expandable	No
Size of retentive memory for retentive data blocks	128 kbyte
Load memory	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
Backup	
present	Yes ; Guaranteed by MMC (maintenance-free)
without battery	Yes ; Program and data
CPU processing times	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
FB	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 kbyte
FC	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 kbyte
OB	
Description	see instruction list
Size, max.	64 kbyte
Number of free cycle OBs	1 ; OB 1
Number of time alarm OBs	1 ; OB 10
Number of delay alarm OBs	2 ; OB 20, 21

Number of time interrupt OBs	4 ; OB 32, 33, 34, 35
Number of process alarm OBs	1 ; OB 40
Number of DPV1 alarm OBs	3 ; OB 55, 56, 57
Number isochronous mode OBs	1 ; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
Number of technology synchronous alarm OBs	1 ; OB 65
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	6 ; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	16
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	Z 0 to Z 7
Counting range	
adjustable	Yes
lower limit	0
upper limit	999
IEC counter	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	No retentivity
Time range	
lower limit	10 ms
upper limit	9990 s
IEC timer	

present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area, total	All, 128 KB max.
Flag	
Number, max.	2048 byte
Retentivity available	Yes ; MB 0 to MB 2047
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	Yes
Local data	
per priority class, max.	32768 byte ; Max. 2048 bytes per block
Address area	
I/O address area	
Inputs	2048 byte
Outputs	2048 byte
of which, distributed	
Inputs	2048 byte
Outputs	2048 byte
Process image	
Inputs	2048 byte
Outputs	2048 byte
Inputs, adjustable	2048 byte
Outputs, adjustable	2048 byte
Inputs, default	128 byte
Outputs, default	128 byte
Default addresses of the integrated channels	
Digital inputs	66
Digital outputs	66
Subprocess images	
Number of subprocess images, max.	1 ; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
Inputs	16384

Outputs	16384
Inputs, of which central	256
Outputs, of which central	256
Analog channels	
Inputs	1024
Outputs	1024
Inputs, of which central	64
Outputs, of which central	64
Hardware configuration	
Expansion devices, max.	0
Number of DP masters	
integrated	2 ; 1 DP and 1 DP (drive)
via CP	2 ; for DP
Number of operable FMs and CPs (recommended)	
FM	8
CP, point-to-point	8
CP, LAN	8
Rack	
Racks, max.	1
Modules per rack, max.	8
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Deviation per day, max.	10 s ; Typ.: 2 s
Backup time	6 wk ; At 40 °C ambient temperature
Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
Number	1
Number/Number range	0
Range of values	0 to 2 ³¹ hours (when using SFC 101)
Granularity	1 hour
retentive	Yes ; Must be restarted at each restart
Clock synchronization	
supported	Yes
to MPI, master	Yes
to MPI, slave	Yes

to DP, master	Yes
to DP, slave	Yes ; Only time-of-day slave
in AS, master	Yes
in AS, slave	Yes
on Ethernet via NTP	Yes ; As client
Digital inputs	
Number of digital inputs	4
of which, inputs usable for technological functions	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
up to 40 °C, max.	4
up to 60 °C, max.	4
vertical installation	
up to 40 °C, max.	4
Input voltage	
Rated value, DC	24 V
for signal "0"	-3 to +5 V
for signal "1"	15 to 30 V
Input current	
for signal "1", typ.	7 mA
Input delay (for rated value of input voltage)	
for counter/technological functions	
at "0" to "1", max.	10 µs ; Typical
at "1" to "0", max.	10 µs ; Typical
Cable length	
Cable length, shielded, max.	1000 m
Digital outputs	
Number of digital outputs	8
of which high-speed outputs	8
Functions	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes
Response threshold, typ.	1,0 A
Limitation of inductive shutdown voltage to	48 V
Controlling a digital input	No
Switching capacity of the outputs	
Lamp load, max.	5 W
Load resistance range	

lower limit	48 Ω
upper limit	4 kΩ
Output voltage	
for signal "0", max.	3 V ; (2L+)
for signal "1", min.	Rated voltage -2.5 V
Output current	
for signal "1" rated value	0.5 A
for signal "1" permissible range for 0 to 60 °C, min.	5 mA
for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
for signal "0" residual current, max.	0.3 mA
Parallel switching of 2 outputs	
for increased power	No
for redundant control of a load	No
Switching frequency	
with resistive load, max.	100 Hz
with inductive load, max.	0.2 Hz ; to IEC 947-5-1, DC-13
on lamp load, max.	100 Hz
Aggregate current of outputs (per group)	
horizontal installation	
up to 40 °C, max.	4 A
up to 60 °C, max.	3 A
all other mounting positions	
up to 40 °C, max.	4 A
Integrated high-speed cams	
Switching accuracy, (+/-)	70 μs
Cable length	
Cable length, shielded, max.	1000 m
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
Encoder	
Connectable encoders	
2-wire sensor	No
Interfaces	
Number of RS 422 interfaces	0
Number of other interfaces	0
1st interface	

Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
MPI	Yes
DP master	Yes
DP slave	Yes
Point-to-point connection	No
MPI	
Transmission rate, max.	12 Mbit/s
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes
S7 communication, as client	No ; but via CP and loadable FB
S7 communication, as server	Yes ; Connection configured on one side only
DP master	
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	Yes ; I blocks only
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes
Equidistance mode support	Yes
Isochronous mode	Yes ; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Number of DP slaves that can be simultaneously activated/deactivated, max.	8
Direct data exchange (slave-to-slave communication)	Yes ; As subscriber
DPV1	Yes

Address area	
Inputs, max.	2 kbyte
Outputs, max.	2 kbyte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
DP slave	
Transmission rate, max.	12 Mbit/s
Automatic baud rate search	Yes ; only with passive interface
Address area, max.	32
User data per address area, max.	32 byte
Services	
PG/OP communication	Yes
Routing	Yes ; Only with active interface
Global data communication	No
S7 basic communication	No
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes ; Connection configured on one side only
Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
Transfer memory	
Inputs	244 byte
Outputs	244 byte
2nd interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
MPI	No
DP master	Yes ; DP(DRIVE)-Master
DP slave	No
Point-to-point connection	No
DP master	
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	64
Services	

PG/OP communication	No
Routing	No
Global data communication	No
S7 basic communication	No
S7 communication	No
Equidistance mode support	Yes
Isochronous mode	Yes
SYNC/FREEZE	No
Activation/deactivation of DP slaves	Yes
DPV1	No
Address area	
Inputs, max.	1024 byte
Outputs, max.	1024 byte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
DP slave	
GSD file	http://support.automation.siemens.com in Product Support area
Transmission rate, max.	12 Mbit/s
3rd interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
Integrated switch	Yes
Number of ports	2
Automatic detection of transmission speed	Yes ; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Media redundancy	
supported	Yes
Switchover time on line break, typically	200 ms ; PROFINET MRP
Number of stations in the ring, max.	50
Functionality	
MPI	No
DP master	No
DP slave	No
PROFINET IO Controller	Yes ; Also simultaneously with IO-Device functionality
PROFINET IO Device	Yes ; Also simultaneously with IO Controller functionality

Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
Web server	Yes
Number of HTTP clients	5
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Number of connectable IO devices, max.	128
Max. number of connectable IO devices for RT	128
of which in line, max.	128
Number of IO Devices with IRT and the option "high performance", max.	64
of which in line, max.	64
Shared device, supported	Yes
Prioritized startup supported	Yes
Number of IO Devices, max.	32
Activation/deactivation of IO Devices	Yes
Maximum number of IO devices that can be activated/deactivated at the same time.	8
IO Devices changing during operation (partner ports), supported	Yes
Max. number of IO devices per tool	8
Device replacement without swap medium	Yes
Send cycles	250 µs, 500 µs, 1 ms, 2 ms, 4 ms
Updating time	250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)
Services	
PG/OP communication	Yes
Routing	Yes
S7 communication	Yes ; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
Isochronous mode	Yes ; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
Address area	
Inputs, max.	2 kbyte
Outputs, max.	2 kbyte
User data consistency, max.	1024 byte
PROFINET IO Device	
Services	
PG/OP communication	Yes
Routing	Yes

S7 communication	Yes ; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
Isochronous mode	No
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
IRT	Yes
PROFenergy, supported	Yes ; With SFB 73 / 74 prepared for loadable PROFenergy standard FB for I-Device
Shared device	Yes
Number of IO controllers with shared device, max.	2
Transfer memory	
Inputs, max.	1440 byte ; Per IO Controller with shared device
Outputs, max.	1440 byte ; Per IO Controller with shared device
Submodules	
Number, max.	64
User data per submodule, max.	1024 byte
Open IE communication	
Open IE communication, supported	Yes
Number of connections, max.	8
Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes ; Via PROFIBUS DP or PROFINET interface
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
supported	Yes
Number of GD loops, max.	8
Number of GD packets, max.	8
Number of GD packets, transmitter, max.	8
Number of GD packets, receiver, max.	8
Size of GD packets, max.	22 byte
Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
supported	Yes
User data per job, max.	76 byte
User data per job (of which consistent), max.	76 byte ; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	

supported	Yes
as server	Yes
As client	Yes ; via integrated PROFINET interface and loadable FB or via CP and loadable FB
User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
S5-compatible communication	
supported	Yes ; via CP and loadable FC
Open IE communication	
TCP/IP	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
Data length for connection type 01H, max.	1460 byte
Data length for connection type 11H, max.	32768 byte
Several passive connections per port, supported	Yes
ISO-on-TCP (RFC1006)	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
Data length, max.	32768 byte
UDP	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
Data length, max.	1472 byte
Web server	
supported	Yes
Number of HTTP clients	5
User-defined websites	Yes
Number of connections	
overall	16
usable for PG communication	15
reserved for PG communication	1
Adjustable for PG communication, min.	1
Adjustable for PG communication, max.	15
usable for OP communication	15
reserved for OP communication	1
adjustable for OP communication, min.	1
adjustable for OP communication, max.	15
usable for S7 basic communication	14
Reserved for S7 basic communication	0
adjustable for S7 basic communication, min.	0
adjustable for S7 basic communication, max.	14
usable for S7 communication	14

reserved for S7 communication	0
Adjustable for S7 communication, min.	0
Adjustable for S7 communication, max.	14
Max. total number of instances	32
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
S7 message functions	
Number of login stations for message functions, max.	16 ; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status block	Yes ; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4 ; without continuation
Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
of which status variables, max.	30
of which control variables, max.	14
Forcing	
Forcing	Yes
Force, variables	Inputs, outputs
Number of variables, max.	10
Diagnostic buffer	
present	Yes
Number of entries, max.	500
adjustable	No
Of which powerfail-proof	100 ; Only the last 100 entries are retained
Number of entries readable in RUN, max.	499
adjustable	Yes ; From 10 to 499
preset	10
Service data	
Can be read out	Yes
Interrupts/diagnostics/status information	
Alarms	
Alarms	No
Diagnostic messages	

Diagnostic functions	No
Diagnostics indication LED	
Status indicator digital output (green)	Yes
Status indicator digital input (green)	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
between the channels and the backplane bus	Yes
Galvanic isolation digital outputs	
between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation checked with	500 V DC
Ambient conditions	
Operating temperature	
Min.	0 °C
max.	60 °C
Configuration	
Configuration software	
STEP 7	Yes
programming	
Command set	see instruction list
Nesting levels	8
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes ; With S7 block Privacy
Dimensions	
Width	120 mm

Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	640 g
Status	Jun 28, 2014